

REMARKS

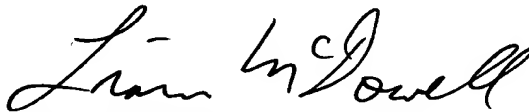
Further to the amendment of June 30, 2005, a verified English translation of Japanese priority document JP 2000-031348 filed February 9, 2000 is submitted herewith.

In view of the amendment and the remarks set forth on June 30, 2005, it is believed that the present application is in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

A handwritten signature in cursive script that reads "Liam McDowell". The signature is written in dark ink and is positioned above a horizontal line.

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APPENDIX:

The Appendix includes the following item:

- verified English translation of Japanese priority document

JP 2000-031348

VERIFICATION OF TRANSLATION

I, Masao Matsumoto

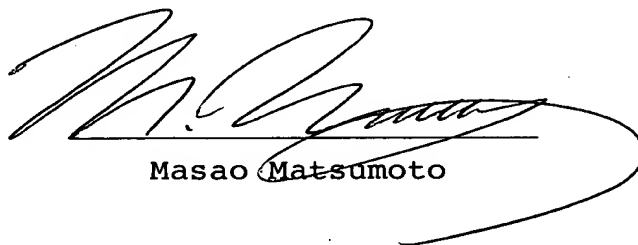
of 7th/F., M&E Bldg. Ikebukuro, 36-10, Nishi-Ikebukuro 2-Chome,
Toshima-ku, Tokyo, Japan

declare as follows:

1. That I am well acquainted with both the English and Japanese languages, and
2. That the attached document is a true and correct translation made by me to the best of my knowledge and belief of:-

The specification accompanying the Application No. 2000-031348
for a patent made in Japan
filed on February 9, 2000.

June 29, 2005



Masao Matsumoto

PATENT OFFICE
JAPANESE GOVERNMENT

This is to certify that the annexed is a true copy of the following application as filed with this Office.

Dated of Application : February 9, 2000

Application Number : Patent Application No.
2000-031348

Applicant(s) : NEC Corporation

December 1, 2000

Commissioner, Kozo OIKAWA
Patent Office

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[IPC CLASSIFICATION] G06F 15/00

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[NUMBER OF PREPAYMENT LEDGER] 030982

[AMOUNT OF PAYMENT] 21000

[THE LIST OF FILING OBJECT]

[THE NAME OF OBJECT] Specification 1

[THE NAME OF OBJECT] Drawing 1

[THE NAME OF OBJECT] Abstract 1

[THE NAME OF DOCUMENT] SPECIFICATION
[TITLE OF THE INVENTION] A DATA CONVERSION SYSTEM
AND A DATA CONVERSION METHOD THEREOF
[CLAIM]

[CLAIM 1] A data conversion system including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of said first communication network and a protocol conversion device provided at a connection point between said first communication network and said second communication network for conducting protocol conversion, comprising:

request transmitting means for adding constraint information peculiar to said terminal device to a request from said terminal device for obtaining predetermined contents from said server device and transmitting the obtained request to said protocol conversion device, and data conversion means for receiving said constraint information from said terminal device to convert predetermined contents obtained from said server device into data based on said constraint information.

[CLAIM 2] The data conversion system as set forth in claim 1, wherein said data conversion means is provided at said protocol conversion device.

[CLAIM 3] The data conversion system as set forth in claim 1 or claim 2, wherein

said protocol conversion device includes:
storage means for storing said constraint

information from said terminal device, and

contents conversion means for converting predetermined contents obtained from said server device based on said constraint information stored in said storage means.

[CLAIM 4] The data conversion system as set forth in claim 1, wherein

said data conversion means is provided at said server device.

[CLAIM 5] The data conversion system as set forth in claim 1 or claim 4, wherein

said protocol conversion device transmits said request received from said terminal device and said constraint information added to said request to said server device, and

said server device includes storage means for storing said constraint information from said protocol conversion device and contents conversion means for converting said predetermined contents based on said constraint information stored in said storage means.

[CLAIM 6] The data conversion system as set forth in claims 1 to 5, wherein

said constraint information includes at least one of size information of images and gradation information of images.

[CLAIM 7] The data conversion system as set forth in claims 1 to 6, wherein

said first communication network is a communication network for portable information terminals and said second communication network is the Internet.

[CLAIM 8] A data conversion method in a data conversion system including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of said first communication network and a protocol conversion device provided at a connection point between said first communication network and said second communication network for conducting protocol conversion, comprising the steps of:

first step of adding constraint information peculiar to said terminal device to a request from said terminal device for obtaining predetermined contents from said server device and transmitting the obtained request to said protocol conversion device, and second step of receiving said constraint information from said terminal device to convert predetermined contents obtained from said server device into data based on said constraint information.

[CLAIM 9] The data conversion method as set forth in claim 8, wherein

said second step includes the steps of:

twenty-first step of determining whether predetermined contents obtained from said server device are image data or not, and

twenty-second step of, when said predetermined contents are image data, converting said predetermined contents into data based on said constraint information.

[CLAIM 10] The data conversion method as set forth in claim 8 or claim 9, wherein

said constraint information includes at least one of size information of images and gradation information of images.

[CLAIM 11] The data conversion method as set forth in claims 8 to 10 , wherein

said first communication network is a communication network for portable information terminals and said second communication network is the Internet.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[FIELD OF THE INVENTION]

The present invention relates to a data conversion system and a data conversion method thereof and, more particularly, to a data conversion system adopted in a system for accessing the Internet from a portable information terminal based on WAP (Wireless Application Protocol) and a data conversion method thereof.

[0002]

[PRIOR ART]

System for accessing the Internet from a portable information terminal based on WAP is composed of a portable information terminal, a WAP proxy as a relay point between

a wireless network and the Internet, a content filter for converting WWW (World Wide Web) contents into WAP contents and a Web server for providing WWW contents or WAP contents. When the portable information terminal makes a request for obtaining contents on the Web server, the contents on the Web server are obtained through the WAP proxy, and when the contents are WWW contents, they are converted into WAP contents by the content filter and then transmitted to the portable information terminal.

[0003]

[PROBLEMS TO BE SOLVED BY THE INVENTION]

The conventional technique, however, has the following problems. The first problem is that conversion of contents by the content filter is not appropriate. In a case of such contents having a large volume of information as image data not directed to a portable information terminal, simply converting the format of the image data is not enough to enable a portable information terminal having a limited display capacity to use the data. Although it is possible to specify a portable information terminal to fixedly convert an image into an image optimum to the terminal, it is impossible in this case to cope with portable information terminals having different performances. The reason is that the contents filter is capable of conducting only fixed contents conversion processing.

[0004]

The second problem is that in a case where appropriate contents need to be provided according to a client of a desktop personal computer, a portable information terminal and the like, it is necessary to prepare contents according to performance of each client such as a display capacity. The reason is that on the side of the WAP proxy and the Web server, automatic conversion of the contents using client information such as a display capacity is not possible.

[0005]

On the other hand, one example of techniques of converting contents having a large volume of information into that appropriate for the portable information terminal is disclosed in Japanese Patent Laying-Open (Kokai) No. Heisei 11-250009 (hereinafter referred to as Literature 1). The technique disclosed in Literature 1 is directed to provision of Internet services enabling access to Web data with ease under mobile environments by obtaining page data from an Internet Web server in response to a request from each terminal device, based on resource information of a terminal device as a transfer destination, converting the obtained page data into data adapted to the terminal device in question and transferring the converted page data to the terminal device.

[0006]

According to the technique recited in Literature 1, the Internet Web server converts data into data adapted to

a terminal device based on resource information from the terminal device. According to the technique disclosed in Literature 1, accordingly, resource information is defined as fixed information upon connection of the terminal device to an Internet service provider (ISP) and the fixed resource information is adopted when resources on the Web server are to be designated (URL: Uniform Resource Locator). Therefore, even when a resource is designated on other Web server thereafter, the formerly adopted resource information will be adopted to make change of resource information difficult.

[0007]

Unlike the technique disclosed in Literature 1, the present invention provides a technique enabling data conversion with resource data changed for each of various Web servers. Then, ease of updating of resource information enables suitable adjustment of communication traffic to adjust responsiveness at the connection of the Internet. Although other examples of techniques of this kind are disclosed also in Japanese Patent Laying-Open (Kokai) No. Heisei 11-306067 (hereinafter referred to as Literature 2) and Japanese Patent Laying-Open No. 11-328075 (hereinafter referred to as Literature 3), means for solving the above-described problems is disclosed neither in Literature 2 nor in Literature 3.

[0008]

An object of the present invention is to provide a

data conversion system which enables data conversion adapted to a terminal device and in which a server device needs not hold data conversion information for each terminal device in advance and a data conversion method thereof.

[0009]

[MEANS TO SOLVE THE PROBLEM]

According to one aspect of the invention, a data conversion system including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of said first communication network and a protocol conversion device provided at a connection point between said first communication network and said second communication network for conducting protocol conversion, comprises request transmitting means for adding constraint information peculiar to said terminal device to a request from said terminal device for obtaining predetermined contents from said server device and transmitting the obtained request to said protocol conversion device, and data conversion means for receiving said constraint information from said terminal device to convert predetermined contents obtained from said server device into data based on said constraint information.

[0010]

According to another aspect of the invention, a data conversion method in a data conversion system

including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of said first communication network and a protocol conversion device provided at a connection point between said first communication network and said second communication network for conducting protocol conversion, comprising the steps of first step of adding constraint information peculiar to said terminal device to a request from said terminal device for obtaining predetermined contents from said server device and transmitting the obtained request to said protocol conversion device, and second step of receiving said constraint information from said terminal device to convert predetermined contents obtained from said server device into data based on said constraint information.

[0011]

In another preferred construction, constraint information is included in the request transmitted to the protocol conversion device from the terminal device. The protocol conversion device converts predetermined contents obtained from the server device into contents suitable for the terminal device based on the constraint information and transmits the contents after conversion to the terminal device.

[0012]

[THE EMBODIED CONFIGURATION OF THE INVENTION]

First, outline of the present invention will be described. The present invention provides a structure enabling, in processing of converting contents from WWW to WAP conducted at the time of access to WWW contents on the Internet from a portable information terminal adapted to WAP through a WAP proxy, conversion of image data having a large volume of information into image data of a size appropriate for the portable information terminal based on information provided from the portable information terminal.

[0013]

In Fig. 1, a content constraint information storage unit 12 stores constraint information of image data usable at a portable information terminal 1. Among the constraint information are "size of image" and "gradation of image" that the portable information terminal 1 can handle, all of which can be set by a Web browser 11. The contents designated by the constraint information need not be equal to a physical display capacity of the portable information terminal 1. For example, even when the portable information terminal 1 is capable of displaying an image of a 16-gradation gray scale having 100 pixels in width and 80 pixels in height, the constraint information can be set to designate "50 pixels in width and 40 pixels in height" and "black and white binary values". The constraint information is stored in a connection information storage unit 22 in a WAP proxy 2 through a WSP (Wireless Session Protocol) request issued from the Web browser 11 at the

time of obtaining the contents on a Web server 3 on the Internet. When the WAP proxy 2 receives an HTTP (Hyper Text Transfer Protocol) response including WWW contents 31 not created for WAP (that is, for the portable information terminal 1) from the Web server 3, the WWW contents 31 are converted into WAP contents at a content conversion unit 23. At this time, with reference to constraint information of image data of the portable information terminal 1 stored in the connection information storage unit 22, the unit 23 converts the image contents into those of a size appropriate for the portable information terminal 1. The HTTP response including the converted contents is converted into a WSP response at the protocol conversion unit 23 and returned to the Web browser 11.

[0014]

Thus converting image data having a large volume of information into that appropriate for the portable information terminal 1 adapted to WAP at the time of access from the portable information terminal 1 to the existing WWW contents 31 realizes easy Web access environments.

[0015]

In the following, embodied configurations of the present invention will be described with reference to the accompanying drawings. Fig. 1 is a diagram showing a structure of a first embodied configuration of a data conversion system according to the present invention. With reference to Fig. 1, the data conversion system includes

the portable information terminal 1 having the Web access function based on WAP such as a portable telephone, the WAP proxy 2 as a connection point between a wireless network to which the portable information terminal 1 belongs and the Internet, and the Web server 3 existing on the Internet for providing various contents.

[0016]

The portable information terminal 1 includes the Web browser 11 and the content constraint information storage unit 12. The Web browser 11 is an interface for accessing contents on the Web server 3 existing on the Internet. The Web browser 11 is also an interface for setting constraint information of image data handled by the portable information terminal 1. As constraint information of image data, "size of image" and "gradation of image" can be set. "Size of image" is the maximum size of images allowed to be displayed on the portable information terminal 1 and is designated by vertical and lateral pixel values of an image. "Gradation of image" is gradation information of an image allowed to be displayed by the portable information terminal 1, by which such information is set as black and white binary values, a gray scale of N (N: positive integer) gradations and N colors. These information elements only need to fall within a range of a physical display capacity that the portable information terminal 1 has. Constraint information of image data is set as one of header information in a WSP request that is

issued at the time of access to WWW contents on the Internet. The content constraint information storage unit 12 is a storage region for storing constraint information of images designated by the Web browser.

[0017]

The WAP proxy 2 includes a protocol conversion unit 21, the connection information storage unit 22 and the content conversion unit 23. The WAP proxy 2 is a point for providing connection environments between the wireless network and the Internet and manages a connection with the portable information terminal 1 and a connection with the Web server 3.

[0018]

The protocol conversion unit 21 conducts conversion from a WSP request to an HTTP request and conversion from an HTTP response to a WSP response. The protocol conversion unit 21, when at the reception of a WSP request, constraint information of image data related to the portable information terminal 1 and information about a type of WAP contents supported by the portable information terminal 1 are included in the header part of the WSP request, preserves these contents in the connection information storage unit 22. At the reception of an HTTP response, the protocol conversion unit 21 transfers a content of the contents and information stored in the connection storage unit 22 to the content conversion unit 23.

[0019]

The connection information storage unit 22 receives constraint information of images related to the portable information terminal 1 and type information of WAP contents supported by the portable information terminal 1 from the protocol conversion unit 21 and manages the information for each connection.

[0020]

The content conversion unit 23, when the contents received from the protocol conversion unit 21 are WWW contents, converts them into WAP contents. Then, when the contents are image data, making use of the constraint information of images preserved in the connection information storage unit 22, the unit 23 conducts size conversion and gradation conversion of the image data and returns the converted contents to the protocol conversion unit 21.

[0021]

The Web server 3 provides various contents on the Internet. Among the contents to be provided are the WWW contents 31 created for the existing Internet and WAP contents 32 created for the portable information terminal 1.

[0022]

Next, operation as a whole of the first embodied configuration will be detailed with reference to Figs. 1 and 2. Fig. 2 is a flow chart showing operation of the first embodied configuration. "Size of image" and

"gradation of image" as constraint information of images in the portable information terminal 1 are stored in the content constraint information storage unit 12 through the Web browser 11. Upon instruction to obtain the WWW contents 31 on the Web server 3 made by the Web browser 11, a WSP request for establishing a connection between the portable information terminal 1 and the WAP proxy 2 is transmitted to the WAP proxy 2.

[0023]

As header information of the WSP request, constraint information of images of the portable information terminal 1 is set together with information such as a type of WAP contents supported by the portable information terminal 1. Upon establishment of a connection, the type information of the WAP contents supported by the portable information terminal 1 and the constraint information of images are preserved from the protocol conversion unit 21 to the connection information storage unit 22 in the WAP proxy 2 for each connection (i.e. for each Web server accessed), so that a WSP response indicative of establishment of the connection is returned to the portable information terminal 1.

[0024]

Next, the portable information terminal 1 transmits a WSP request for obtaining the WWW contents 31 to the WAP proxy 2. The WSP request is converted into an HTTP request at the protocol conversion unit 21 and the HTTP request is

transmitted to the Web server 3 after the WAP proxy 2 succeeds in establishing a connection with the Web server 3. The Web server 3 returns an HTTP response including the WWW contents 31 whose acquisition is requested in its data part to the WAP proxy 2. The protocol conversion unit 21 of the WAP proxy 2 having received the HTTP response transfers the contents included in the data part of the HTTP response to the content conversion unit 23 together with the information included in the connection information storage unit 22.

[0025]

The content conversion unit 23 checks a type of the received contents to determine whether conversion of the contents is necessary or not (that is, whether they are WAP contents supported by the portable information terminal 1 or not) and whether conversion to appropriate WAP contents is possible or not (Steps A1 and A2 of Fig. 2). In a case where conversion of the contents is necessary ("yes" at Step A1) but conversion to the WAP contents supported by the portable information terminal 1 is impossible ("no" at Step A2), delete the contents (Step A3) and return the same to the protocol conversion unit 21 (Step A8).

[0026]

On the other hand, in a case where contents conversion is required ("yes" at Step A1) and conversion to the WAP contents supported by the portable information terminal 1 (e.g. conversion of HTML (Hyper Text Markup

Language) to WML (Wireless Markup Language), conversion of an image format not supported by the portable information terminal 1 into an image format supported by the same) is possible ("yes" at Step A2), conduct processing of conversion to appropriate WAP contents (Step A4). When conversion of the contents is not necessary ("no" at Step A1), conduct none of processing.

[0027]

Next, determination is made whether the WAP contents obtained by conversion at Step A4 or the WAP contents subjected to none of processing at Step A1 ("no" at Step A1) are image data (Step A5). When the WAP contents are not image data ("no" at Step A5), they are returned to the protocol conversion unit 21 without conversion (Step A8). On the other hand, when the WAP contents are image data ("yes" at Step A5), determination is made whether there exists constraint information or not (Step A6). Then, when constraint information exists ("yes" at Step A6), the WAP contents are converted so as to satisfy the constraint information (Step A7) and WAP contents obtained as a result of the conversion are returned to the protocol conversion unit 21 (Step A8). On the other hand, when no constraint information exists ("no" at Step A6), the WAP contents are returned to the protocol conversion unit 21 without conversion (Step A8).

[0028]

After converting all the data part in the HTTP

response into WAP contents by means of the content conversion unit 23, the protocol conversion unit 21 converts the HTTP response to a WSP response and transmits the WSP response to the Web browser 11.

[0029]

Next, operation of the first embodied configuration will be described with respect to a specific example. Fig. 3 is a schematic diagram showing specific operation of the first embodied configuration. As illustrated in the figure, assume, for example, that in the connection information storage unit 22, "type of contents supported by the portable information terminal 1" and "constraint information of image data in the portable information terminal 1" are preserved at the time of establishment of a connection between the portable information terminal 1 and the WAP proxy 2 and that while the connection exists, an HTTP response including JPEG (Joint Photographic Expert Group) images as contents is received from the Web server 3. Type of the contents in the HTTP response is a JPEG image (image/jpeg) and not supported by the portable information terminal 1, so that conversion of the contents is required ("yes" at Step A1). On the other hand, since a GIF (Graphic Interchange Format) image (image/gif) is supported by the portable information terminal 1, when conversion from JPEG to GIF exists, determination is made that conversion of the contents is possible ("yes" at Step A2) to convert a JPEG image to a GIF image (Step A4). Moreover,

since the contents are picture images ("yes" at Step A5), confirmation of existence/non-existence of constraint information related to the image data is made (Step A6). Since constraint information of the image data is registered at the connection information storage unit 22 ("yes" at Step A6), change an image size and gradation information so as to satisfy these constraint information (so as to fall within a size indicated in the constraint information and within a range of gradation information) (Step A7). The converted image data is returned to the protocol conversion unit 21 (Step A8). The protocol conversion unit 21 replaces the data received from the content conversion unit 23 with the contents in the HTTP response, converts the HTTP response into a WSP response and transmits the WSP response to the Web browser 11.

[0030]

Next, second embodied configuration will be described. Fig. 4 is a diagram showing a structure of the second embodied configuration. In the figure, the same components as those of Fig. 1 are indicated by the same reference numerals to which no description is made here. With reference to the figure, the second embodied configuration is different from the first embodied configuration in that a Web server 5 includes a connection information storage unit 51 and a content conversion unit 52 in addition to the components of the Web server 3 shown in Fig. 1.

[0031]

The connection information storage unit 51 is a part for storing information related to a connection between the WAP proxy 2 and the Web server 5 and similarly to the connection information storage unit 22, stores constraint information of image related to the portable information terminal 1 and type information of contents that the portable information terminal supports.

[0032]

The content conversion unit 52 conducts conversion from WWW contents to WAP contents and conversion of image contents based on constraint information by making use of constraint information of images of the portable information terminal 1 and type information of contents that the portable information terminal supports all of which information is stored in the connection information storage unit 51. Conversion processing is conducted following the processing steps shown in Fig. 2 similarly to the content conversion unit 23.

[0033]

Next, operation of the second embodied configuration will be detailed with reference to Fig. 4. Processing of setting up a connection between the portable information terminal 1 and the WAP proxy 2 upon instruction on acquisition of the WWW contents 31 on the Web server 5 by the Web browser 11 is the same as that of the first embodied configuration shown in Fig. 1. In the processing

of setting up a connection between the WAP proxy 2 and the Web server 5, the WAP proxy 2, at the time of transmitting an HTTP request for setting up a connection to the Web server 5, adds "WAP content type that the portable information terminal 1 supports" and "constraint information of images of the portable information terminal 1" preserved in the connection information storage unit 22 to a header of the HTTP request. The Web server 5 preserves these pieces of information in the connection information storage unit 51 at the time of setting-up of the connection and returns an HTTP response indicating that the connection is established to the WAP proxy.

[0034]

When a WSP request for obtaining the WWW contents 31 is transmitted from the portable information terminal 1 to the WAP proxy 2, the request is converted into an HTTP request by the protocol conversion unit 21 of the WAP proxy 2 and transmitted to the Web server 5. In the Web server 5, the contents of the WWW contents 31 whose acquisition is requested and information stored in the connection information unit 51 are transferred to the content conversion unit 52. Contents conversion processing is conducted based on the processing steps shown in Fig. 2 in the same manner as that conducted by the content conversion unit 23 of the WAP proxy 2. The WAP contents obtained as a result of the conversion processing are set at a data part of an HTTP response and transmitted to the WAP proxy 2. In

the WAP proxy 2, no conversion processing is conducted in particular for the contents stored in the HTTP response and the HTTP response is converted into a WAP response at the protocol conversion unit 21 and transmitted to the portable information terminal 1.

[0035]

By providing the specific Web server 5 with a contents conversion mechanism making use of constraint information of image data, the second embodied configuration produces new effects, distribution of load on contents conversion processing conducted at the WAP proxy 2 and reduction in communication traffic between the WAP proxy 2 and the Web server 50.

[0036]

[THE EFFECT OF THE INVENTION]

The present invention relates to a data conversion system including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of the first communication network and a protocol conversion device provided at a connection point between the first communication network and the second communication network for conducting protocol conversion, in which provided are a request transmission means for transmitting, from the terminal device to the protocol conversion device, a request for obtaining predetermined contents from the server device and constraint information

peculiar to the terminal device so as to be contained in the request, and a data conversion means for receiving the constraint information from the terminal device to convert the predetermined contents obtained from the server device into data based on the constraint information, thereby realizing data conversion adapted to the terminal device and eliminating the need of the server device to hold data conversion information for each terminal device in advance.

[0037]

According to another aspect, the present invention relates to a data conversion method in a data conversion system including a terminal device belonging to a first communication network, a server device belonging to a second communication network having a protocol different from that of the first communication network and a protocol conversion device provided at a connection point between the first communication network and the second communication network for conducting protocol conversion, which method includes a first step of transmitting, from the terminal device to the protocol conversion device, a request for obtaining predetermined contents from the server device and constraint information peculiar to the terminal device so as to be contained in the request, and a second step of receiving the constraint information from the terminal device to convert the predetermined contents obtained from the server device into data based on the constraint information to produce the same effect as that

of the present invention described above.

[0038]

More specifically, the first effect is that the volume of information to be transferred when a portable information terminal having rigid limitations of a display capacity accesses WWW contents including image data having a large volume of information can be reduced, thereby enabling easy Internet access from a portable information terminal. The reason is that by converting image data returned by a Web server based on constraint information of image data that a portable information terminal allows, image data appropriate to the portable information terminal can be obtained any time.

[0039]

The second effect is eliminating the need of a provider of Web contents to prepare a plurality of Web contents such as "those for a portable terminal A", "those for a portable terminal B" and "those for a desktop personal computer". The reason is that with only one image data (for desktop personal computers) whose volume of information is the largest prepared, contents are automatically converted into appropriate images according to a portable information terminal for use.

[0040]

In addition, according to the present invention, constraint information peculiar to a terminal device is transmitted from the terminal device to a predetermined

server device through a protocol conversion device. The present invention therefore enables transmission of different pieces of constraint information from a terminal device to each server device. In other words, updating of resource information is easy, so that communication traffic can be suitably adjusted to adjust responsiveness at the time of a connection to the Internet.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig. 1] Fig. 1 is a diagram showing a structure of a data conversion system according to a first embodiment of the present invention.

[Fig. 2] Fig. 2 is a flow chart showing operation of the first embodiment.

[Fig. 3] Fig. 3 is a schematic diagram showing specific operation of the first embodiment.

[Fig. 4] Fig. 4 is a diagram showing a structure of a second embodiment;

[THE DESCRIPTION OF THE NUMERALS]

- 1 portable information terminal
- 2 WAP proxy
- 3, 5 Web server
- 11 Web browser
- 12 content constraint information storage unit
- 21 protocol conversion unit
- 22, 51 connection information storage unit
- 23, 52 content conversion unit
- 31 WWW contents

32 WAP contents

[THE NAME OF DOCUMENT] ABSTRACT

[ABSTRACT]

[OBJECT] The present invention is to provide a data conversion system which enables data conversion adapted to a terminal device and in which a server device needs not hold data conversion information for each terminal device in advance.

[CONSTITUTION] In a data conversion system, a WSP request for obtaining WWW contents 31 of a Web server 3 is sent from a terminal device 1 to a WAP proxy 2 and constraint information of images of the terminal device 1 is added to header information of the request. Upon reception of the constraint information, the WAP proxy 2 converts the WWW contents 31 obtained from the Web server 3 into data based on the constraint information, so that the WWW contents 31 converted into the data are transmitted to the terminal device 1.

[SELECTED DRAWING] Fig. 1

【図 1】 **FIG. 1**

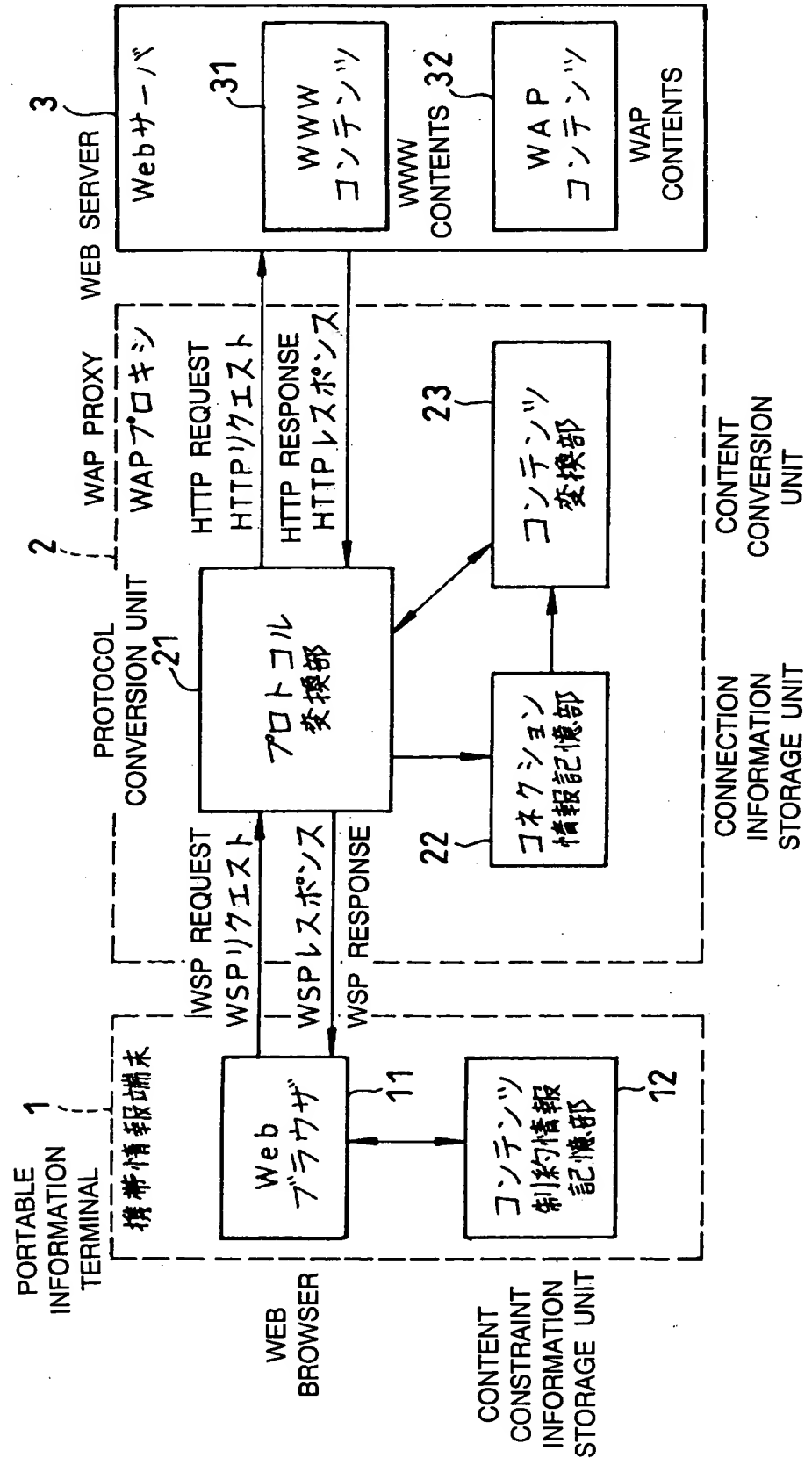


FIG. 2

【図2】

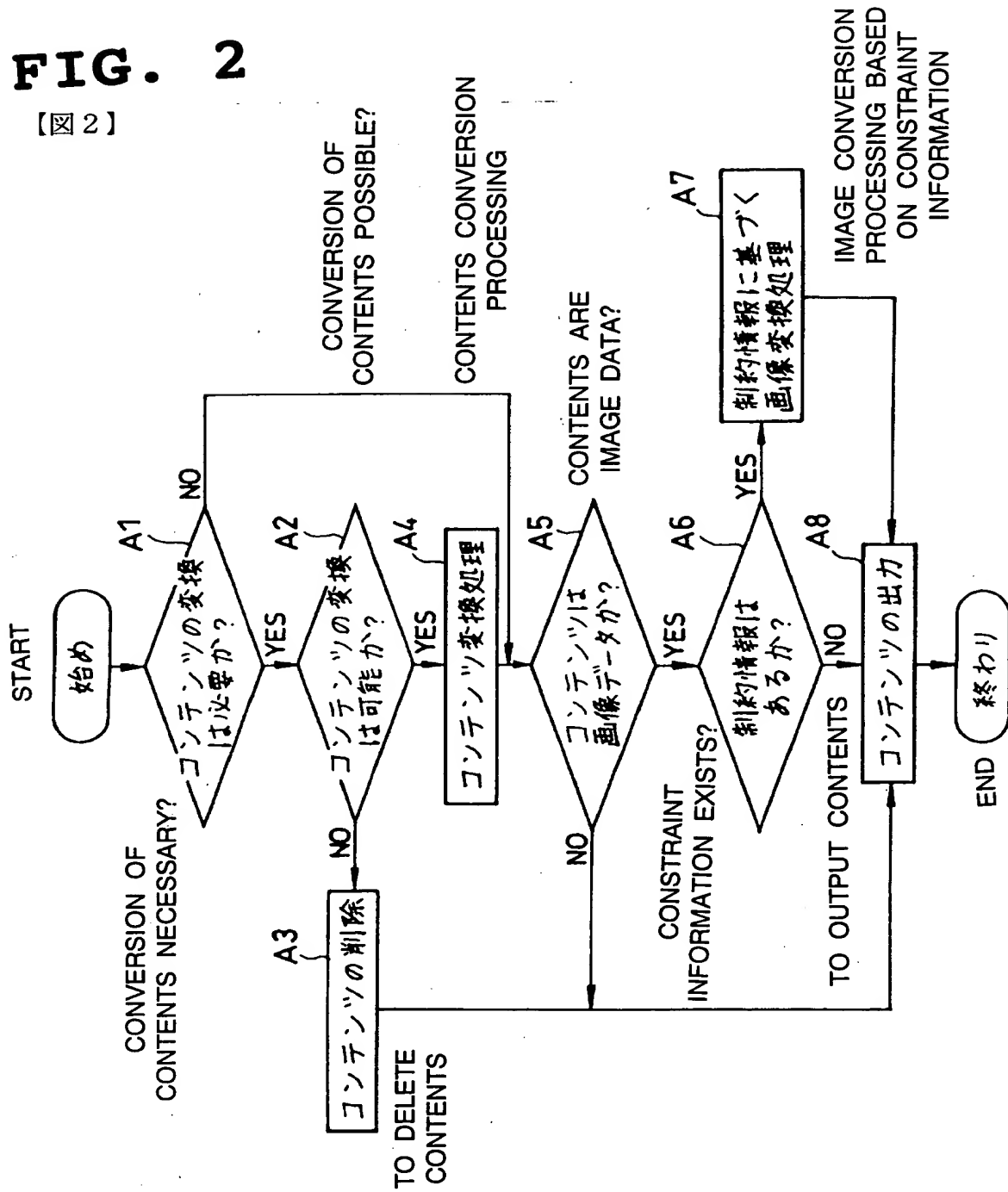


FIG. 3

